

REMARKS

Claim Status

Claims 1-24 were originally presented for examination in this application. In a preliminary amendment filed on May 14, 2004, Applicants added new claims 25-31. A restriction requirement issued on April 25, 2007, and Applicants elected claims 1-21 and 25-31 in response thereto. An office action issued on August 24, 2007, in which all pending claims were rejected, and an amendment and response was filed in which certain claim amendments were presented to overcome the rejects. A final office action issued on April 14, 2008, upholding the rejections, and a subsequent response was filed on May 29, 2008. A subsequent office action issued on July 11, 2008, again rejecting all pending claims, and a response was filed on November 4, 2008. An office action was then issued on January 26, 2009, in which the claims were again rejected, and a response was filed on May 20, 2009. A final office action then issued on August 21, 2009, in which:

- Claims 1-14 and 25 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter.
- Claims 1, 2, 8, 9, 12, 13, 15, 16, 19, 25, 26 and 29 were rejected under 35 U.S.C. §103(a) as being obvious in light of a paper by Olson et al. entitled “Moving Object Detection and Event Recognition Algorithms for Smart Cameras” (“Olson”) in view of U.S. Patent No. 6,570,608 to Tserng (“Tserng”).
- Claims 3-7 were rejected under 35 U.S.C. §103(a) as being obvious in light of Olson and further in view of U.S. Patent No. 6,570,608 to Tserng (“Tserng”) and U.S. Patent No. 5,845,009 to Marks et al. (“Marks”).
- Claims 10, 11, 17, 18, 20, 27, 28 and 30 were rejected under 35 U.S.C. §103(a) as being obvious in light of Olson and Tserng and further in view of U.S. Patent No. 6,371,805 to Brodsky et al. (“Brodsky”).

- Claims 14, 21 and 31 were rejected under 35 U.S.C. §103(a) as being obvious in light of Olson and Tserng and further in view of U.S. Patent No. 6,441,846 to Carlbom et al. (“Carlbon”).

In this response, Applicants have amended claims 1, 15, and 17-21 and cancelled claim 3 to address these rejections. No new matter has been added.

Information Disclosure Statement

Applicants thanks the Examiner for considering the references cited in prior Information Disclosure Statements, and further submits a new Supplemental Information Disclosure Statement herewith, and requests that the references included be considered prior to any subsequent Office Actions.

Claim Rejections Under 35 U.S.C. §101

Claim 1 has been amended to add physical, structural elements, namely a receiver and a tracking module to perform the claimed functions. Therefore, Applicants respectfully request the withdrawal of these rejections.

Claim Rejections Under 35 U.S.C. §103(a)

Independent claims 1, 15 and 19

Independent claims 1, 15 and 19 each recite using video frames generated “over time” to “concurrently” track objects “with respect to a monitored environment” as they traverse the environment in a manner that is “independent of calibration among the image sensors and the monitored environment.” Critically, the tracking of the objects as they “move between fields-of-view” is based on a probability that one of the objects in a first video frame generated by one image sensor at a first time will be included in a second video frame generated by a second image sensor at a second point in time. This claim element correlates to originally-filed claim 3.

In the most recent Office action, the Examiner cited the “probability matrices” of Marks in rejecting claim 3. These matrices do not represent the probabilities that an object will appear in a particular video frame after being identified in another frame, as claimed. Marks, generally,

is directed to identifying “an object in an image.”¹ More specifically, Marks’ technique comprises two phases – a “modeling procedure” and a “tracking procedure.”² The modeling procedure “creates models of the object that can be used to later locate the object in the tracking image.”³ Of critical importance is that the object (singular) is being tracked in the tracking image (again, singular). Essentially, the modeling process of Marks creates “a statistical model of the head” and a “statistical model of the torso” as input for the tracking phase.⁴ In the tracking phase, the object is tracked in the image, which facilitates “controlling of the video camera in response to the location of object within the tracking images.”⁵ (emphasis added). Also during the tracking phase, Marks uses “a series of probability matrices” that represent probabilities “that the object is present at various locations *within the tracking image*.”⁶ (emphasis added). In effect, the Marks system identifies an object of interest within a single image, and uses a model of that object to track the object as it moves about the field-of-view of a single camera. The probabilities referred to by Marks are simply used to determine the likelihood that an object is at a particular location in the image – not to track the object among multiple fields of view over time, as claimed.

In contrast, the claims recite tracking objects among multiple cameras using probabilities that represent the likelihood an object will appear on *another camera* once seen on a first camera. By way of example, consider a person leaving a room in which a surveillance camera has been installed and having two exits, each exit leading into separate hallways, in which additional cameras have been installed. Further, one of the exits is a door into an often-used hallway, whereas the other door leads to a rarely-used fire escape. Using Marks’ system, the user is tracked as he moves about the field-of-view of the room camera, but once he leaves, there is no way of knowing (or even inferring) in which camera’s field-of-view he will appear on next. Marks’s probability matrices identify certain objects as being the same objects seen in previous frames, but ultimately always by the same camera. Using the claimed invention, however, the system determines, by tracking objects over time, that the probability a person exited the room into the hallway is 95%, and into the fire escape is 5%, for example. Therefore, when the

¹ Marks, Abstract.

² Marks, column 3, lines 51-52.

³ Marks, column 4, lines 3-5.

⁴ Marks, column 4, lines 26-30.

⁵ Marks, column 4, lines 46-48.

⁶ Marks, column 5, lines 40-45.

individual leaves the field-of-view of the room camera, the system can “guess” (correctly, in most instances) that the next camera on which they will appear is the hallway camera, even if, as may be the case in certain situations, the fields-of-view of the two cameras do not overlap. Such information may be used, for example, to provide selected video feeds to surveillance personnel, or initiate recordings of activities based on a likely event or movements without having to monitor or activate numerous cameras. Because the Marks system does not have the claimed probabilistic feature, it cannot provide such functionality.

Independent claims 17, 18 and 20

Independent claims 17 and 20 recite applying the monitoring and tracking techniques of claims 1 and 15 in a particular environments but still include the distinguishing limitations of claims 1 and 15 described above. The Examiner has cited Brodsky for the limited purpose of illustrating that surveillance may be performed in parking lots, and as such, Brodsky does not cure the deficiencies of Olson.

Independent claim 21

Independent claim 21 recites applying the monitoring and tracking techniques of claims 1 and 15 in a particular environment but still includes the distinguishing limitations of claims 1 and 15 described above. The Examiner has cited Carlbom for the limited purpose of illustrating that surveillance may be performed retail establishments, and as such, Carlbom does not cure the deficiencies of Olson.

Thus, because none of the cited references teach or suggest every element of independent claims 1, 15, 17, 18, 19, 20 and 21, Applicants respectfully submit that these references, either alone or in combination, fail to anticipate or render these claims obvious. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1, 15, 17, 18, 19, 20 and 21 under 35 U.S.C. §103(a), as well as those claims that depend directly or indirectly therefrom.

CONCLUSION

Applicants respectfully requests allowance of claims 1,2, 4-21 and 25-31 in due course. The Examiner is invited to contact Applicants' undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully submitted,

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